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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,599	12/20/2001	Victor Yeeman Lo	2991	4529

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EXAMINER

PAYNE, DAVID C

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 02/13/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/029,599

Applicant(s)

LO, VICTOR YEEMAN

Examiner

David C. Payne

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant appears to have inadvertently appended the date "Jun. 29, 2001" at the end of the claim.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 28, 29, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Hait US 2002/0080436 A1 (Hait).

Regarding claims 1, 28, 29 (as it is understood based on the 112 rejection above) and 35,

Hait disclosed a plurality of transmitter data processors (e.g., Figure 2 (12n)) receiving a plurality data channel inputs for transmission over said optical network, said transmitter data

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processors being time division multiplexed by said plurality of data channel inputs into a plurality of temporal and spatial data streams (e.g., paragraph 0210);

a plurality of optical sources (e.g., Figure 3 (44), paragraph 0105) being directly modulated by said plurality of temporal data streams; a plurality of polarization modulators (e.g., paragraph 0183) receiving said plurality of temporally modulated optical sources and spatially modulating the polarization states of the received optical sources by said plurality of spatial data streams from said plurality of transmitter data processors;

wavelength division multiplexer (e.g., Figure 25 (214)) for wavelength division multiplexing data streams received from said plurality of polarization modulators; an optical fiber cable receiving and transmitting said plurality of wavelength division multiplexed data streams modulators (e.g., Figure 1 (30), paragraph 0102);

a wavelength division demultiplexer (e.g., Figure 25 (216)) for wavelength division demultiplexing said plurality of wavelength division multiplexed data streams transmitted by said fiber-optics cable;

a plurality polarization demodulators (e.g., Figure 48 (422), paragraph 0310) for polarization demodulating said plurality of data streams received from said wavelength division demultiplexer; a plurality of detectors (e.g., Figure 23A (180a/180b), paragraph 0178) for direct detection of a plurality of temporal data streams from said plurality of polarization demodulators;

a plurality of receiver data processors (e.g., Figure 2 (36)) for demultiplexing said plurality of temporal data streams from said plurality of detectors and a plurality of spatial data streams received from said plurality of polarization demodulators into a plurality of data output channels;

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 3, 7-13, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait).

Regarding claims 2 and 30, Hait does not disclose the system in which said plurality of polarization modulators are digital modulators. However, Hait does disclose hardware transparency that operates in the digital or analog domain (e.g., paragraph 0183) and digital pulses (e.g., paragraph 0311). It would have been obvious to one of ordinary skill in the art at the time of invention to use digital modulators in the Hait invention given the use of digital signals, hardware transparency and that digital modulators would be required to modulate digital signals.

Regarding claim 3, Hait does not disclose in which said digital modulators produce a plurality of polarization levels to map to  $2^M$  distinct states where M equals the number of polarization levels. However, it would have been obvious to one of ordinary skill in the art at

the time of invention that all digital systems are designed to produce  $2^M$  distinct states based on the number of distinct digital values.

Regarding claim 8, Hait disclosed said plurality optical sources are indirectly temporally modulated in amplitude at the outputs by said plurality of polarization modulators by said plurality of data streams from said plurality of transmitter data processors (e.g., paragraph 0032).

Regarding claims 9 and 32, Hait disclosed said plurality optical sources are indirectly temporally modulated in phase at the outputs by said plurality of polarization modulators by said plurality of data streams from said plurality of transmitter data processors (e.g., paragraph 0032).

Regarding claim 10, Hait disclosed said plurality optical sources are indirectly temporally modulated in frequency at the outputs by said plurality of polarization modulators by said plurality of data streams from said plurality of transmitter data processors (e.g., paragraph 0032).

Regarding claims 7 and 11, Hait does not disclose direct modulation or electro-optic modulators. However, it would have been obvious to one of ordinary skill in the art at the time of invention to use direct electro-optic modulation, as this is a common inexpensive mode of modulation.

Regarding claim 12, Hait disclosed which said plurality of detectors for direct detection of a plurality of temporal data streams from said a plurality of polarization demodulators are photo-detectors (e.g., Figure 23A (180a/180b), paragraph 0178).

Regarding claim 13, Hait disclosed in which said plurality of detectors coherently optically demodulate outputs received from said plurality of polarization demodulators.  
(e.g., paragraph 0184).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Jopson et al. US 6,385,356 B1 (Jopson).

Regarding claim 4, Hait does not disclose a system in which said plurality of polarization demodulators are Stokes parameter estimators having a control loop for tracking polarization state changes; and a decision logic block. Jopson disclosed a way of providing feedback to a polarization controller to manage the Stoke's parameters (e.g., Figure 5). It would have been obvious to one of ordinary skill in the art at the time of invention to use the Stoke's feedback control loop in the Hait invention control the differential group delay caused by a mismatch in polarization transmission along the fiber and thereby align the signal polarization with the principal states of polarization of the fiber (e.g., col. 4, lines 40-55).

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8. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Naito US 6,427,043 (Naito).

Regarding claims 5 and 16, Hait does not disclose including one or more optical amplifiers in said fiber-optical cable to extend the transmission distance of said fiber-optics cable. Naito disclosed including one or more optical amplifiers in said fiber-optical cable to extend the transmission distance of said fiber-optics cable (e.g., col. 5, lines 1-15). It would have been obvious to one of ordinary skill in the art at the time of invention to employ the Naito amplifiers in the Hait invention as to compensate for losses that occur in the transmission path over long distance, see passage cited.

9. Claims 6, 17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Tajima US 20010030787 (Tajima).

Regarding claims 6, 17 and 31, Hait does not disclose including a multiple channel optical wavelength channel multiple cross-connect inserted in said fiber-optics cable for reusing each wavelength channel multiple times for connecting additional transmitters and receivers. Tajima disclosed including a multiple channel optical wavelength channel multiple cross-connect inserted in said fiber-optics cable for reusing each wavelength channel multiple times for connecting additional transmitters and receivers (e.g., Figure 3 (33) paragraph 0038). It would have been obvious to one of ordinary skill in the art at the time of invention to employ the Tajima cross-connect in the Hait system so that



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one could broadcast or multicast signals in the network without having to duplicate expensive light sources.

10. Claims 14 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Hansen et al. US 6,078,418 (Hansen).

Regarding claims 14 and 33, Hait does not disclose in which said coherent optical demodulator is an optical source using homodyne demodulation. Hansen disclosed using homodyne demodulation (e.g., col. 5 lines 20-40). It would have been obvious to one of ordinary skill in the art at the time of invention to employ homodyne demodulators in the Hait invention since the side bands produced as a result could be used to calculate the phase modulation see passage cited above.

11. Claims 18-27, and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Milton et al. US 6,631,018 (Milton).

Regarding claims 18 and 21, Hait does not disclose in which said network is a fiber-optics transmission ring network. Milton disclosed a multi-wavelength system transmitting TDM signals on a ring (e.g., col. 1 lines 23-40). It would have been obvious to one of ordinary skill in the art at the time of invention use the Hait system on a ring network since ring networks are well known in the art for interconnecting nodes in a survivable network, see citation

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above.

Regarding claims 19 and 22, the modified invention of Hait and Milton disclosed in which; said ring network includes a plurality of add/drop nodes (e.g., Figure 4) each operating at a specific wavelength with L time division multiplexed channels; said plurality of add/drop nodes being between said wavelength division multiplexer and said wavelength division demultiplexer.

Regarding claims 20 and 23, the modified invention of Hait and Milton disclosed in which each of said plurality of add/drop nodes has a receiver/transmitter pair (e.g., col. 5 lines 65-67).

Regarding claims 24, 26 and 36, Hait does not disclose in which said optical network is a star coupled network having a plurality of nodes connected by a star coupler. Milton disclosed a star coupled network as an alternative to a ring network (e.g., col. 4 lines 50-57). It would have been obvious to one of ordinary skill in the art at the time of invention use the Hait system on a star network, as these are traditional networks that are used to connect a source to many receivers.

Regarding claims 25 and 27, Hait the elements claimed as previously cited above, see claim 1.

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Regarding claims 37 and 38, the modified invention of Hait and Milton does not disclose a data bus network. However Milton does discuss using traditional methods of connection (e.g., col. 4 lines 50-57). It would have been obvious to one of ordinary skill in the art at the time of invention that fiber data bus are very well known methods of connecting nodes since they provide a simple broadcast signal mechanism for tapped nodes.

12. Claims 15 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait US 2002/0080436 A1 (Hait) in view of Godfrey US 5,060,225 (Godfrey).

Regarding claims 15 and 34, Hait does not disclose in which said coherent optical demodulator is an optical source using heterodyne demodulation. Godfrey disclosed using heterodyne demodulation (e.g., col. 6 lines 30-35). It would have been obvious to one of ordinary skill in the art at the time of invention to employ heterodyne demodulators in the Hait invention since heterodyne demodulation is superior in a demanding signal to noise application.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (703) 306-0004. The examiner can normally be reached on M-F, 7a-4p.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dcp

  
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